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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/655,304	09/05/2000	Tsutomu Hiroki	196743US2	8484

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EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 01/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

mk-5

Office Action Summary

Application No.

09/655,304

Applicant(s)

HIROKI, TSUTOMU

Examiner

Karla Moore

Art Unit

1763

-- **Th MAILING DATE of this communication app ars on th cov r sh et with the correspondenc address --**

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 13-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 10-19 is/are rejected.
- 7) ☒ Claim(s) 2-9 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group 1, claims 1-12 and 16-20, in Paper No. 4 is acknowledged. The traversal is on the ground(s) that no basis was given on how Group 1 functions without the complete subject matter of Group 2. This is not found persuasive because none of independent claims 1, 12 or 16 of Group 1 recite or require all of the structural limitations present in independent claim 13 of Group 2. Therefore, the combination (16) claim can be said to not require the particulars of the subcombination (13) as claimed for patentability. Further, the accommodating apparatus of claim 13 could be used in several different types of chambers in combination with any number of transfer apparatus.
2. Applicant's further traverse the restriction on the ground(s) that the search and examination would not place a serious burden on the examiner. Examiner points out that transfer apparatus and work support apparatus as claimed in the present application do have separate classifications and would require different searches

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on

Art Unit: 1763

or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent Publication No. 09-216182 A to Toba et al.

4. Toba et al. disclose a transfer apparatus for a semiconductor process, comprising: an articulated arm unit (13) attached to a support base (10) to be stretchable/retractable within a horizontal plane, the articulated arm unit having a distal end arm (12) which reciprocates in a first direction when the articulated arm unit stretches and retracts; a support member (14) arranged on the distal end arm to support a target substrate, the support member being attached the distal end arm to be reciprocable in the first direction; a main driving mechanism (15) configured to stretch/retract the articulated arm unit; and a sub-driving mechanism (21) configured to reciprocate the support member relative to the distal end arm.

5. With respect to claim 7, Toba et al. further teach the use of a pair of separate motor drives so that an approach shifting of the support member is done independently of a rotation shifting of the arms. The signals for controlling the position of the articulated arm unit are controlled via controller (40; abstract and advantage).

6. Claims 1-4, 10-12, and 16-17 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,306,380 to Hiroki.

6. Hiroki discloses a transfer apparatus for a semiconductor process in Figures 2, 4 and 5, comprising: an articulated arm unit (7) attached to a support base (9) to be stretchable /retractable within a horizontal plane, the articulated arm unit having a distal end arm (7b) which reciprocates in a first direction when the articulated arm unit stretches and retracts; a support member (7c) arranged on the distal end arm to support a target substrate (S), the support member being attached to the distal end arm to be reciprocable in the first direction; a main driving mechanism (multiple part numbers-54, 58, 62, 64; column 4, 55-65) configured to stretch/retract the articulated arm unit; and a sub-driving mechanism

Art Unit: 1763

(multiple part numbers-86, 92, 94, 96, 98, 102; column 5, rows 8-32) configured to reciprocate the support member relative to the distal end arm.

7. With respect to claim 2, the support member reciprocates relative to the distal end arm, while the articulated arm stretches/retracts (see Figures 6A-6E).

8. With respect to claim 3, the sub-driving mechanism is mechanically connected to the main driving mechanism, such that reciprocation of the support member is performed in accordance with stretching/retracting of the articulated arm unit (see Figures 5 and Figures 6A-6E).

9. With respect to claim 4, the sub-driving mechanism includes a pair of pulleys (86 and 94) axially supported by the distal end arm, and a timing belt (92) extending between the pulleys, the belt being connected (by shaft, 96) to the support member.

10. With respect to claims 10 and 17, the apparatus further comprises a pair of temporary shelves (Figure 1 and 2, 8) configured to support the target substrate, and disposed to sandwich the support member when the articulated arm member and the support member retract, and a vertical driving mechanism (56) configured to vertically drive the support member and the temporary shelves relative to each other in order to transfer the target substrate there between.

11. With respect to claim 11, the articulated arm unit is rotatable within a horizontal plane relative to the support base, and the transfer apparatus further comprises a rotational driving mechanism (multiple part numbers-54, 58, 62, 64, 66; column 4, row 60 through column 5, row 7) configured to rotate the articulated arm mechanism.

12. With respect to claim 12, the claim limitations are an alternative combination of those recited above.

13. With respect to claim 16, the semiconductor processing system may further comprise: an airtight process chamber (3a and 3c, column 3, rows 34-36); a worktable (11) with a mount surface to support a target substrate disposed in the process chamber; a supply system configured to supply a process gas into the process chamber (column 3, rows 26-29; though the supply system is not explicitly mentioned in the disclosure, it would be inherently present in an apparatus); an exhaust system (column 3, rows 34-36) configured to evacuate an interior of the process chamber by vacuum; and an airtight transfer chamber

Art Unit: 1763

(1, column 3, rows 30-32) connected to the process chamber through a gate (4) housing the transfer apparatus described above.

14. Claims 1-3, 10-12 and 16-19 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,331,095 to Hiroki .

15. Hiroki discloses a transfer apparatus for a semiconductor process in Figures comprising: an articulated arm unit (10 B-E) attached to a support base (10A) to be stretchable/retractable within a horizontal plane, the articulated arm unit having a distal end arm (10D) which reciprocates in a first direction when the articulated arm unit stretches and retracts; a support member (10E) arranged on the distal end arm to support a target substrate (1), the support member being attached to the distal end arm to be reciprocable in the first direction; a main driving mechanism (10H) configured to stretch/retract the articulated arm unit; and a sub-driving mechanism (10J) configured to reciprocate the support member relative to the distal end arm.

16. With respect to claim 2 and 19, the support member reciprocates relative to the distal end arm, while the articulated arm stretches/retracts (see Figures 4, 5 a-g and 6 a-g).

17. With respect to claim 3, the sub-driving mechanism is mechanically connected to the main driving mechanism, such that reciprocation of the support member is performed in accordance with stretching/retracting of the articulated arm unit (see Figures 4).

18. With respect to claims 10 and 17, the apparatus further comprises a pair of temporary shelves (Figure 1, 4) configured to support the target substrate, and disposed to sandwich the support member when the articulated arm member and the support member retract, and a vertical driving mechanism (not numbered; rows 5-20) configured to vertically drive the support member and the temporary shelves relative to each other in order to transfer the target substrate there between.

19. With respect to claim 11, the articulated arm unit is rotatable within a horizontal plane relative to the support base, and the transfer apparatus further comprises a rotational driving mechanism (10G; column 5, rows 51-52) configured to rotate the articulated arm mechanism.

20. With respect to claim 12, the limitations are an alternative combination of those recited above.

Art Unit: 1763

21. With respect to claim 16, the semiconductor processing system may further comprise: an airtight process chamber (2, column 4, rows 26-36); a worktable (7) with a mount surface to support a target substrate disposed in the process chamber; a supply system configured to supply a process gas into the process chamber (column 4, rows 60-63); an exhaust system (column 4, rows 65-66) configured to evacuate an interior of the process chamber by vacuum; and an airtight transfer chamber (3; column 4, rows 43-46) connected to the process chamber through a gate (4) housing the transfer apparatus described above.

22. With respect to claim 18, Hiroki further discloses an apparatus comprising; a set of first lifters (Figure 2; 9A) and a second set of lifters (9B) disposed to surround the worktable and configured to assist loading/unloading of the target substrate on/from the mount surface, the first set of lifters and the second set of lifters providing support levels at different heights for the target substrate; and a lifter driving mechanism for vertically driving the first and second lifters relative to the worktable (column 5, rows 12-45).

23. Claims 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,135,608 to Okutani in view of Japanese Patent Publication No. 09-216182 A to Toba et al.

24. Okutani disclose a semiconductor processing system comprising: an airtight process chamber (Figures 1, 9 and 10; Figure 32; column 5, rows 3-4); a worktable (548) with a mount surface to support a target substrate disposed in the process chamber; a supply system (578) configured to supply a process gas into the process chamber; an exhaust system (585) configured to evacuate an interior of the chamber by vacuum; an airtight transfer chamber (Figure 1. 6) connected to the process chamber through a gate (12 and 13); and a transfer apparatus (7) disposed in the transfer chamber to load/unload the target substrate into/from the process chamber.

25. However, Okutani fail to disclose the articulated arm unit as claimed.

26. Toba et al. disclose the articulated arm unit as claimed and as described above including a controller for driving the sub-driving mechanism independently of the main driving mechanism for the purpose of conveying substrates with improved rotor endurance, prevention of twisting of cables during arm and hand movement and improved reliability (abstract/advantage).

Art Unit: 1763

27. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a transfer unit as taught in Toba et al. in Okutani in order to convey substrates with improved rotor endurance, prevention of twisting of cables during arm and hand movement and improved reliability.

Allowable Subject Matter

28. Claims 5-6 and 8-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

29. The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach or fairly suggest a transfer apparatus for a semiconductor process as recited in independent claim 1 and dependent claim 3, wherein the sub-driving mechanism includes a pair of sprockets axially supported by the distal end arm, and a chain extending between the pair of sprockets, the chain being connected to the support member or wherein the sub-driving mechanism is connected to the main driving mechanism through a speed increasing device.

Conclusion

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

Application/Control Number: 09/655,304

Art Unit: 1763

Page 8

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January 13, 2003

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